University of Agronomic Sciences and Veterinary Medicine of Bucharest
Faculty of Horticulture

International Student Symposium *"Hortus Academicus"*
April 16, 2021, Bucharest, Romania

INTEGRATED MANAGEMENT OF PESTS AND DISEASES IN PEPPERS

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GUTUE MINODORA

IACOMI BEATRICE

INTRODUCTION

Solanaceous vegetables form one of the most important technological groups, which are grown in our country, **the bell pepper - Capsicum annum Group**, occupying an important place in the economy of our country, having the number of uses.

The research carried out the role of making observations regarding the **monitoring** and **identification** of the main pathogens and pests encountered in the culture, the **assessment** of the risks of attack, their **prevention** and **integrated control** as efficiently and with a low degree of pollution and damage to plants, respectively existing microfauna.

INTRODUCTION

Integrated control aims to **reduce** the number of chemical treatments, **using low-toxic and selective pesticides**, using **biological** methods (using biopreparations, zoophagous launches) and **biotechnical** (mass capture of males), the application of **warning** treatments and **only exceeding** the economic threshold of damage **(PED).**

Pepper crops are frequently **attacked** by **pathogens** such as **viruses, mycoplasmosis, bacteriosis and mycoses**, as well as **pests** such as **nematodes, arachnids, thysanoptera, hemiptera, lepidoptera, dipterans, orthoptera, coleoptera**, etc., the most dangerous phase **being the larva**.

INTRODUCTION

Plant protection actions have a decisive role in limiting damage caused by pests and phytopathogens.

At present, it is not possible to conceive of obtaining high and quality productions without taking into account the **entomological** and **phytopathological** factor.

Of great importance is the **verification of the effectiveness** that is done starting with: **quality control of treatments, their biological actions, production and influences on the environment.**

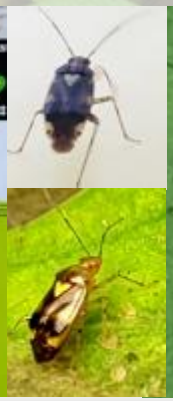
INTRODUCTION

For **effective control** we use

varieties and **hybrids**

(with resistance and tolerance to pests and pathogens),

certified seeds, **disinfection of premises**, **vigorous** and **healthy seedlings**, **placed against insects**, respect for **cultural hygiene**, **natural extracts** and **preparations**, **useful microorganisms**, **predators** and **parasites**, **traps** and **bait** and so on.



OBJECTIVES

In this paper we aimed to **monitor** and **control pests** and **pathogens** in our own culture of **bell peppers** in **solariums**, from Matca, Galati county, during 2020.

THE MAIN OBJECTIVES WERE:

- **Carrying out a technological program to combat** pathogens and pests in pepper for pepper cultivation.
- **Detection, identification and monitoring** of pests and diseases.
- **Pest control** by using zoophages and biological products, but also with chemicals, using products compatible with biological control, so as not to kill predators.
- **Control of pathogens** with chemicals and biologicals.
- **Proper application of fertilizers** to increase plant **resistance to attack** and to find the fastest solutions to **macro** and **micro element deficiencies**.

MATERIALS AND METHODS

- **Biological material: Blancina F1 hybrid.**
- **Insect pests:** *Polyphagotarsonemus latus, Thrips tabaci, Trialeurodes vaporariorum, Tetranychus urticae, Myzus persicae, Macrosiphum euphorbiae, Helicoverpa armigera, Deroceras agreste.*
- **Pathogens**: *Tomato spotted wilt virus in pepper* - TSWV, *Xanthomonas vesicatoria, Phytophtora capsici, Botrytis cinerea, Fusarium oxysporum, Tobacoo mosaic virus in pepper* (TMV).
- **Calcium deficiency.**
- **Predators:** *Orius laevigatus, Amblyseius swirskii.*
- Yellow and blue **adhesive traps**
- **Phytosanitary products and devices for the application of chemical and biological treatments.**
- **Microscope (binocular), magnifying glass and camera.**

MATERIALS AND METHODS

1. Methods for detecting and monitoring pests and pathogens in protected areas:

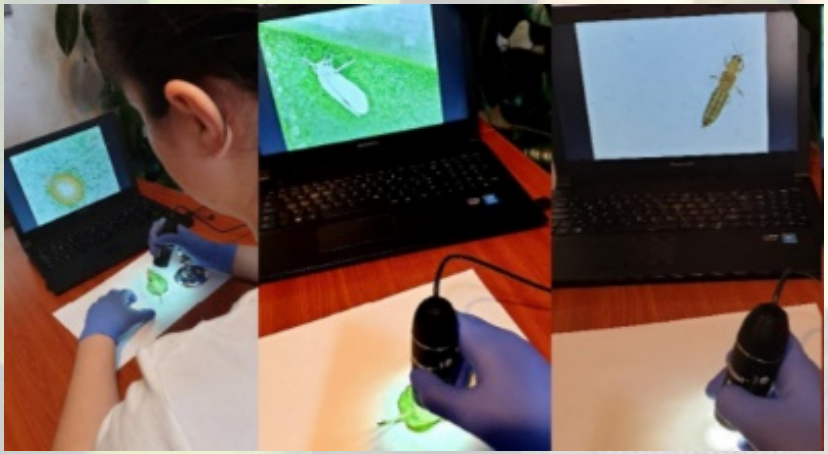
The **observations** were made **visually** with the help of **adhesive traps** in the seedling phase, as well as with the help of a magnifying **glass** and a digital microscope **(binocular),** immediately after planting and throughout the vegetation period.

Objective: **monitoring the dynamics** of harmful and useful **insects**, as well as following the appearance of the **first signs of infection** with pathogens.

MATERIALS AND METHODS

2. Methods for the determination of pathogens and pests detected

The collected material was observed visually and transported to laboratories. The samples collected were analyzed in the laboratory, and the identification was made based on morphological characteristics at the level of genus and species, as well as the main symptoms on leaves and fruits.



For this I used the optical device **(binocular)**.

Phytopathological and entomological material

MATERIALS AND METHODS

3. Methods for testing the efficacy of the plant protection products used

When applying the treatments, the presence of zoophages was taken into account in order not to diminish their species. The treatments were applied both root and foliar.

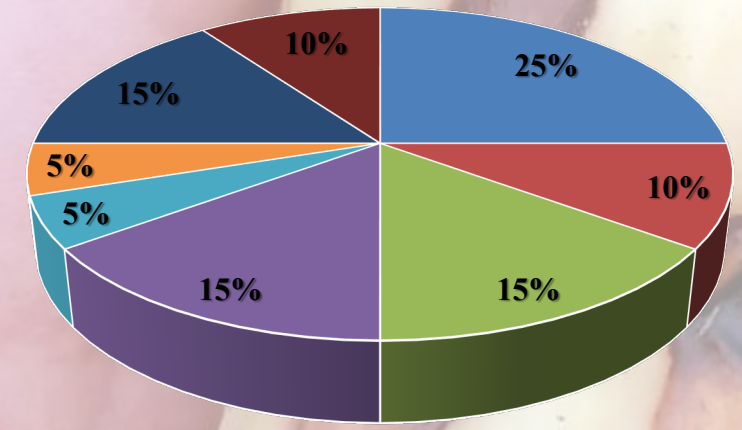
- **Preventive**
- **Before the larvae enter the fruit**
- A very **good coverage** of the foliar apparatus and of the fruits was ensured.
- **Various** root and leaf **treatments** were applied at an interval of about 10 days.

Observations were made **2 and 7 days** after treatment.

RESULTS AND DISCUSSIONS

1. RESULTS REGARDING THE IDENTIFICATION AND MONITORING OF AGENTS PATHOGENS

PATHOGENS



Leaf samples were taken (one sample consisting of 8 leaves), which were brought to the laboratory. Under the binocular magnifying glass the present stages have been checked.

Samples were taken **before** and **after treatment**.

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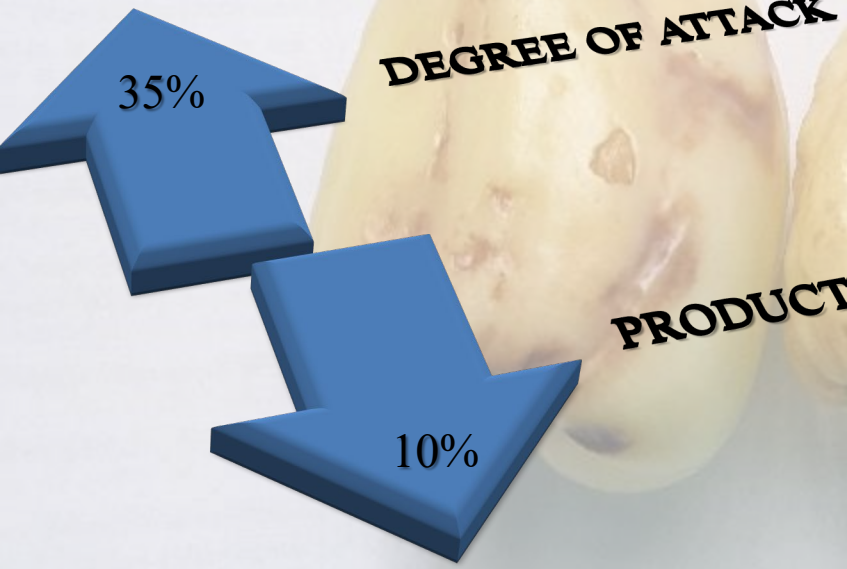
RESULTS AND DISCUSSIONS

1.1 RESULTS ON THE EFFECTIVENESS OF THE TREATMENT PROGRAM IN THE MANAGEMENT OF PATHOGEN ATTACKS



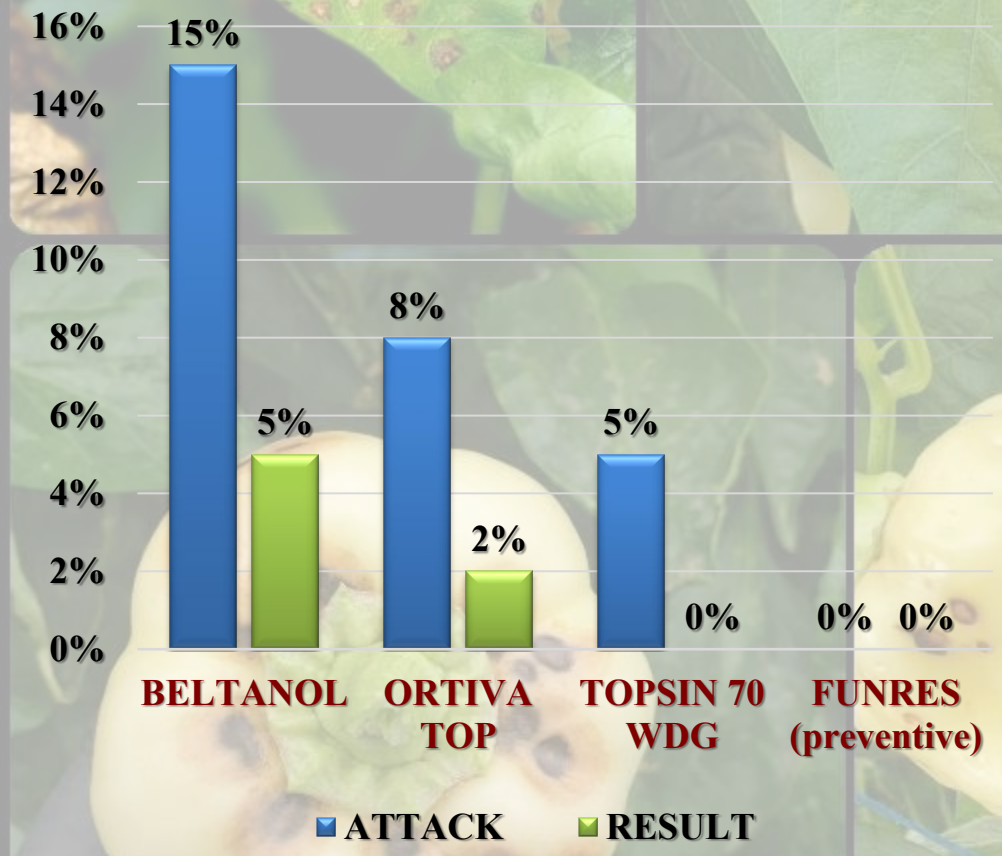
Bronze spot disease (*Tomato spotted wilt virus in pepper - TSWV),* major problems encountered in a solarium: **Bio Shore.**

Pepper mosaic *(Tobacco mosaic virus in peppers – TMV)*: a less dangerous virus.

RESULTS AND DISCUSSIONS

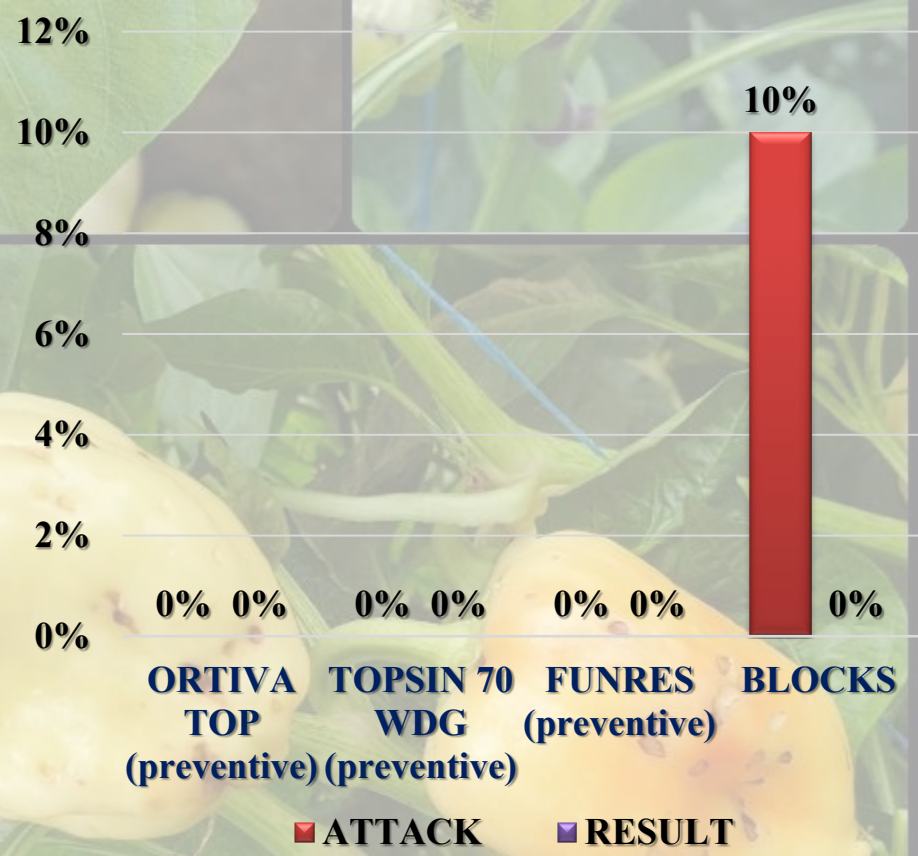
1.1 RESULTS ON THE EFFECTIVENESS OF THE TREATMENT PROGRAM IN THE MANAGEMENT OF PATHOGEN ATTACKS

XANTHOMONAS VESICATORIA



PYTHIUM ULTIMUM

– preventive spraying on seedlings –

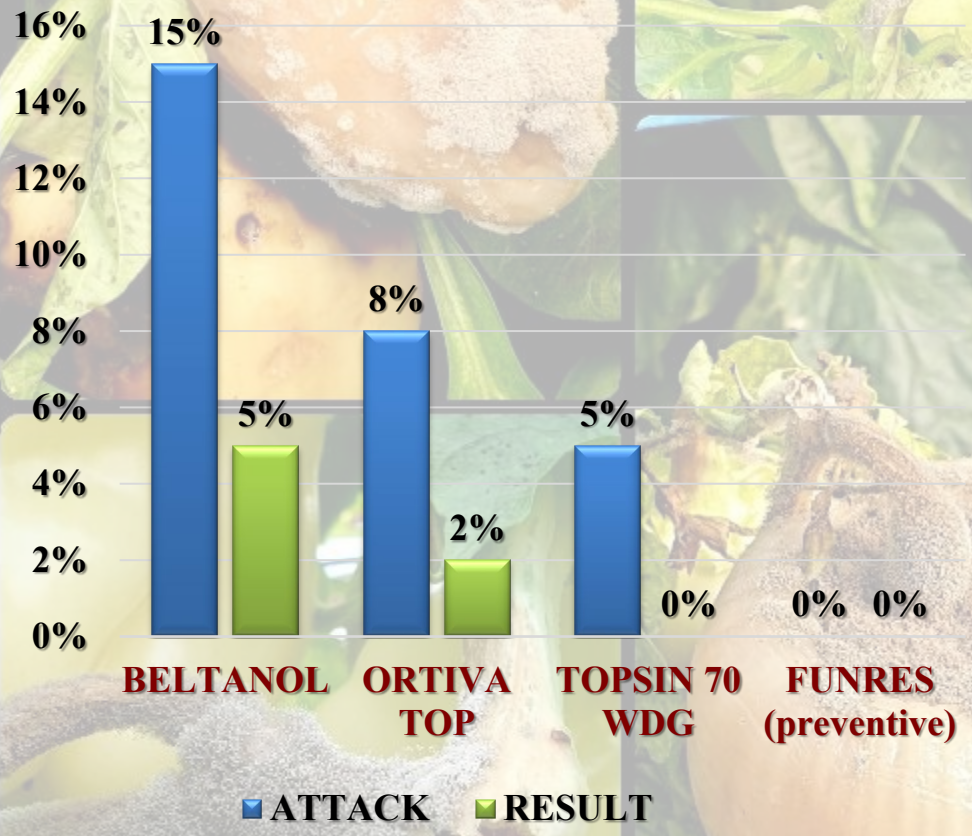


RESULTS AND DISCUSSIONS

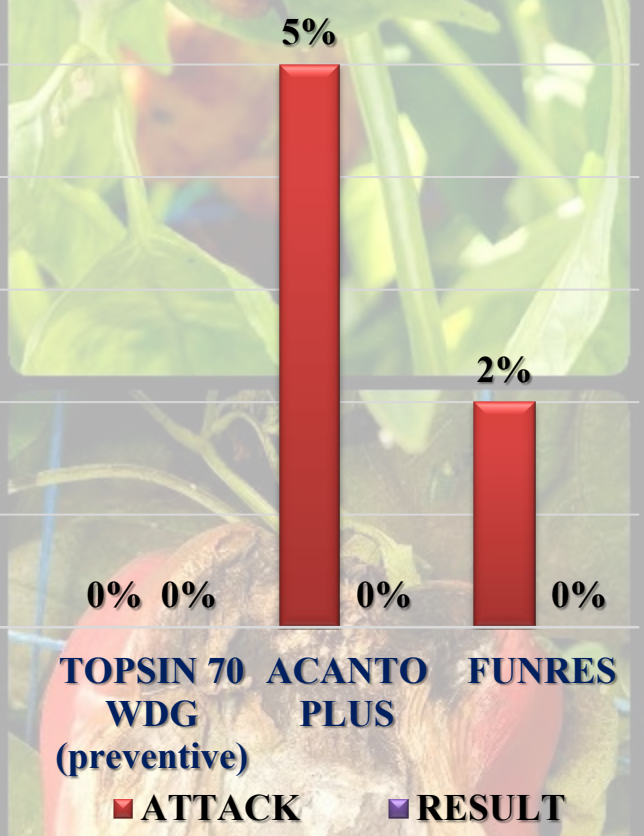
1.1 RESULTS ON THE EFFECTIVENESS OF THE TREATMENT PROGRAM IN THE MANAGEMENT OF PATHOGEN ATTACKS

PHYTOPHTHORA CAPSICI

– isolated, only at the level of roots and stems –



BOTRYTIS CINEREA



RESULTS AND DISCUSSIONS

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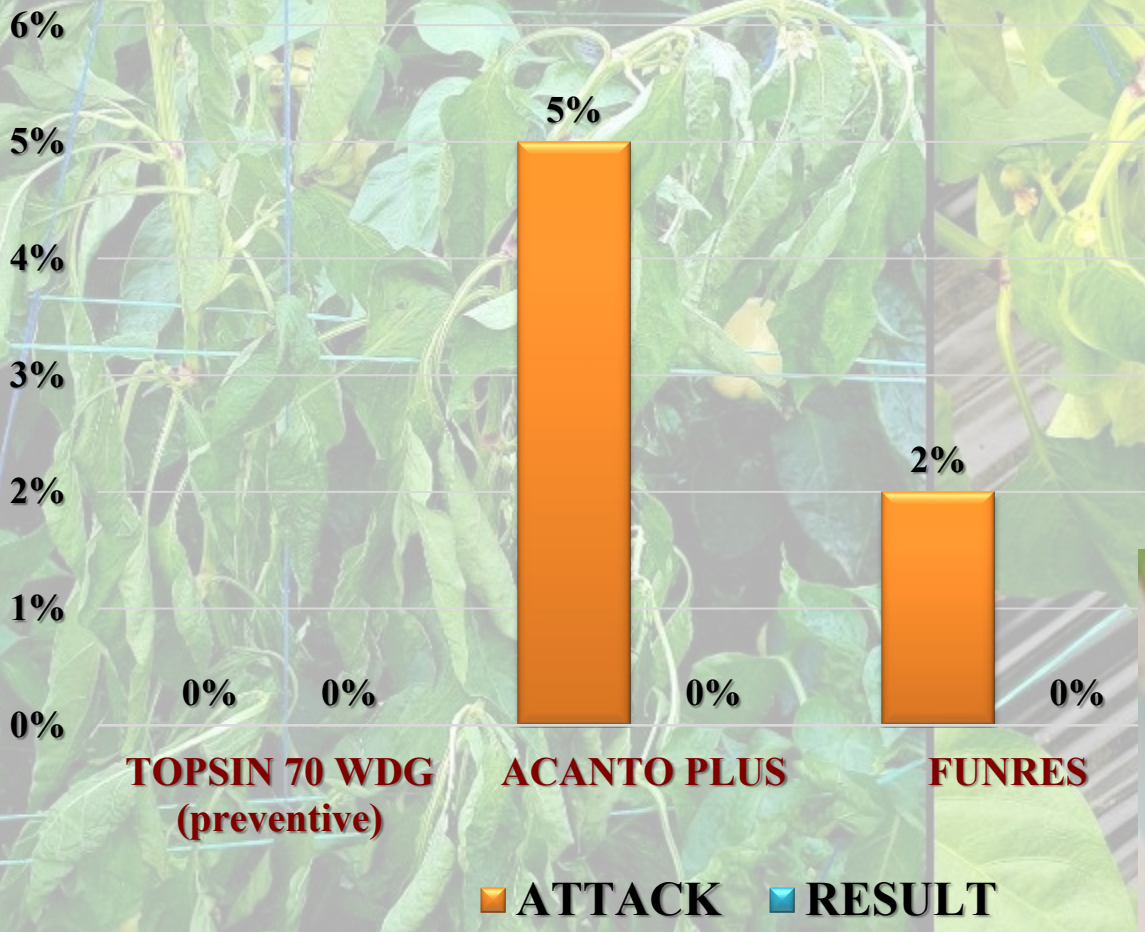
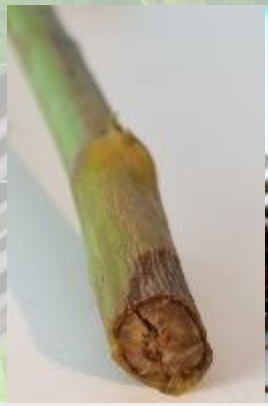
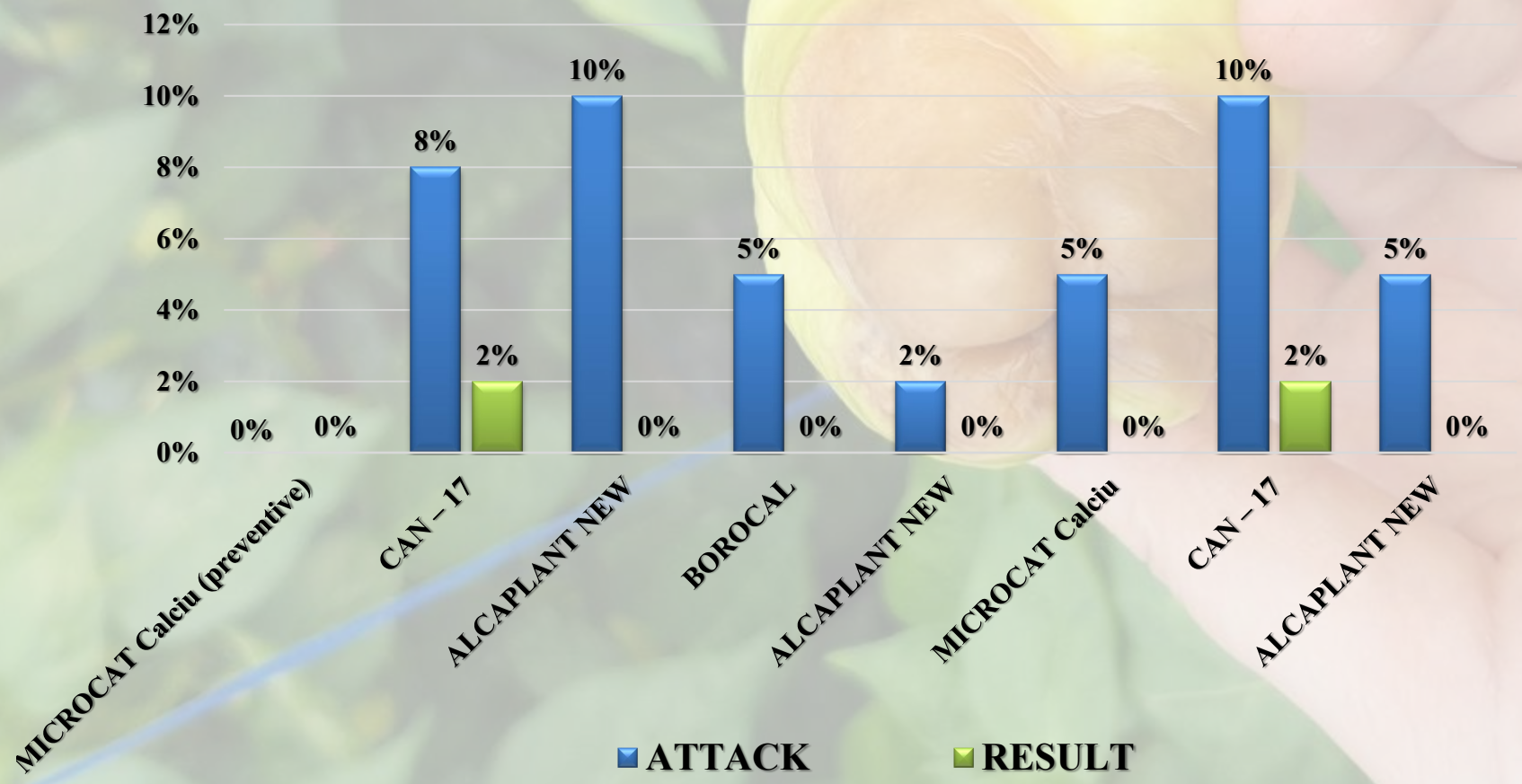


FUSARIUM OXYSPORUM



RESULTS AND DISCUSSIONS

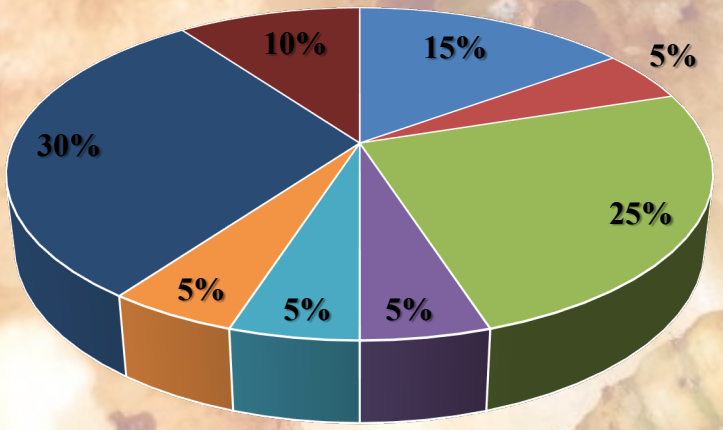
1.2 RESULTS REGARDING DEFICIENCY MONITORING OF CALCIUM



RESULTS AND DISCUSSIONS

2. RESULTS FOR THE IDENTIFICATION AND MONITORING PESTS

PEST STRUCTURE



Leaf samples were taken (one sample consisting of 8 leaves), which were brought to the laboratory. Under the binocular magnifying glass the present stages have been checked.

Samples were taken **before** and **after treatment**.

RESULTS AND DISCUSSIONS

2.1. RESULTS REGARDING THE USE OF PRADATORS IN CULTURE

Orius Laevigatus (adult *thrips* + *spider*) - was released into the culture in date 13.05.2020, and **Amblyseius Swirskii (*Thrips* + *Trialeurodes vaporariorum*)** in date 10.06.2020.

Treatments - 25%

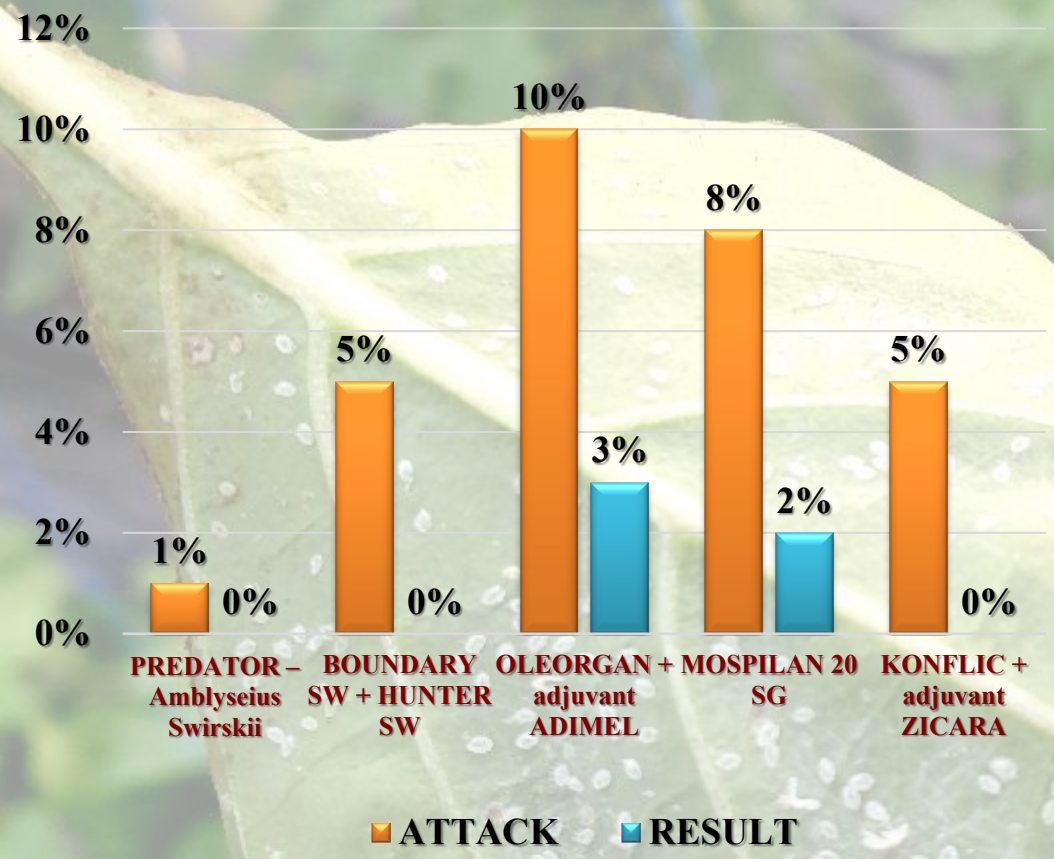
Both predators showed very good **results**, **reducing** the need for treatment compared to last year, bringing production **increases** and a much better **quality**.

Zoophagy + 15 %

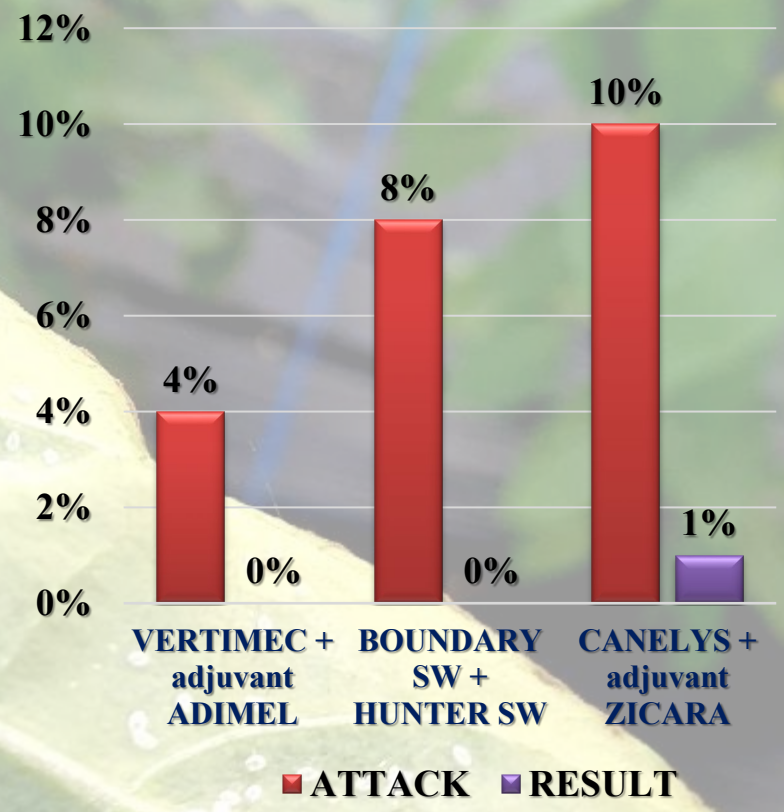
RESULTS AND DISCUSSIONS

2.2. RESULTS ON THE EFFECTIVENESS OF THE TREATMENT PROGRAM IN THE MANAGEMENT OF PESTS ATTACKS

TRIALEURODES VAPORARIORUM



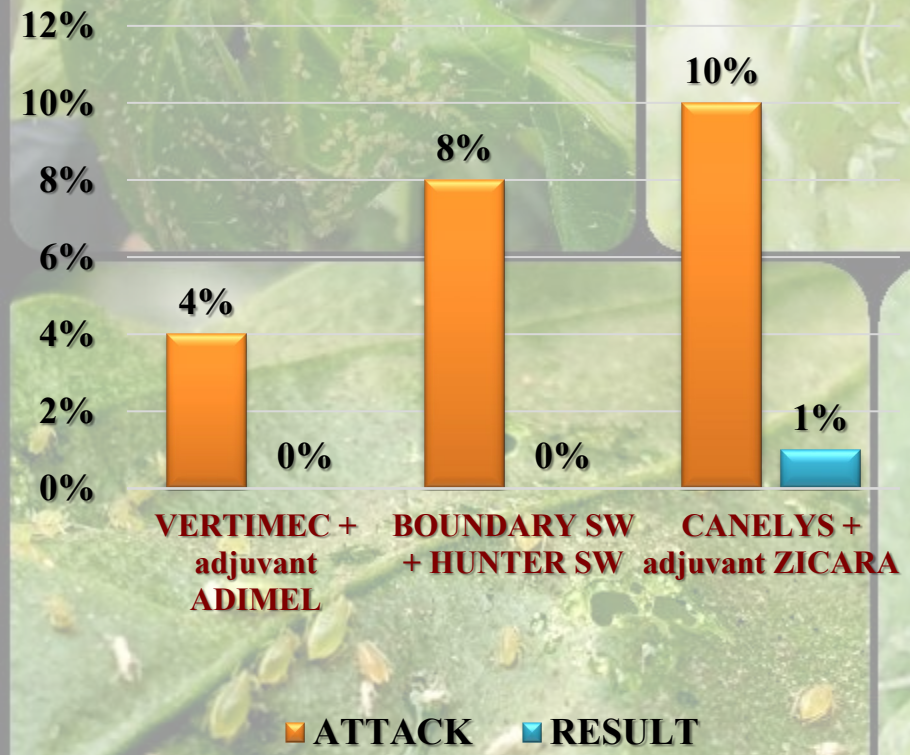
MYZUS PERSICAE



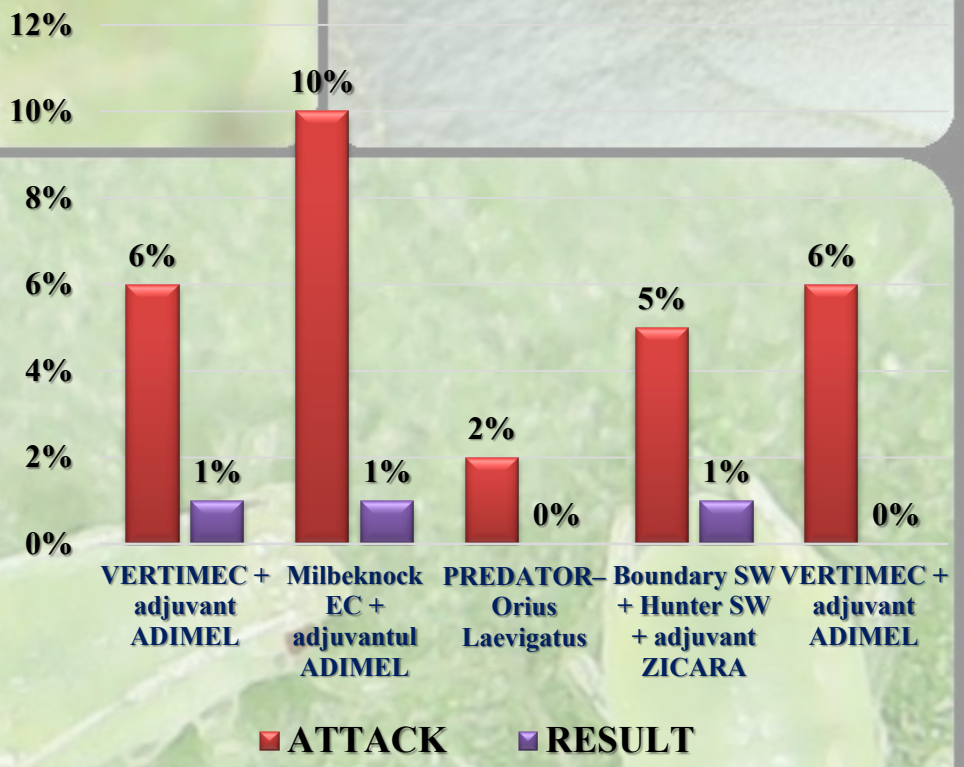
RESULTS AND DISCUSSIONS

2.2. RESULTS ON THE EFFECTIVENESS OF THE TREATMENT PROGRAM IN THE MANAGEMENT OF PESTS ATTACKS

MACROSIPHUM EUPHORBIAE



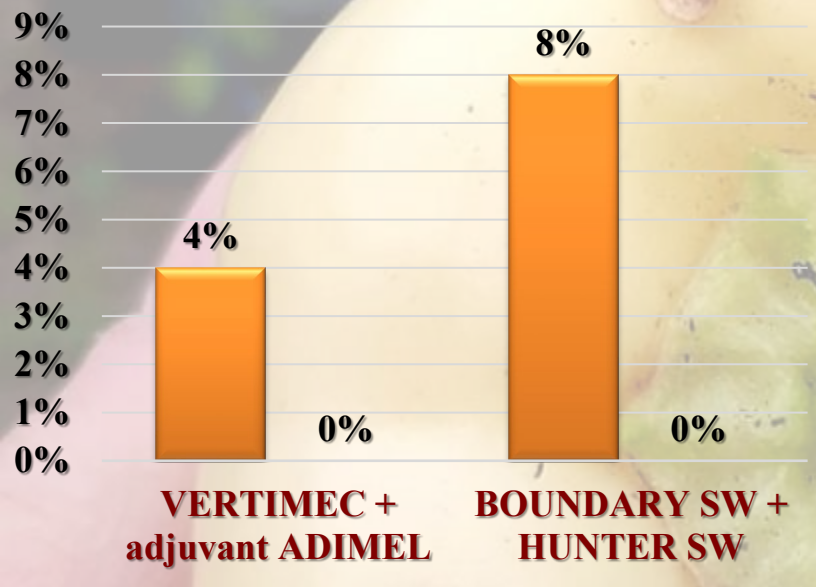
THRIPS TABACI

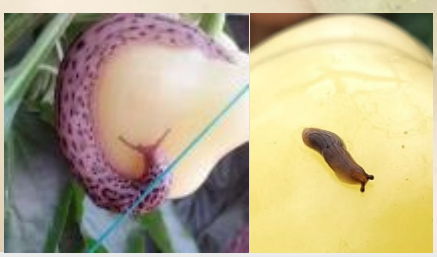


RESULTS AND DISCUSSIONS

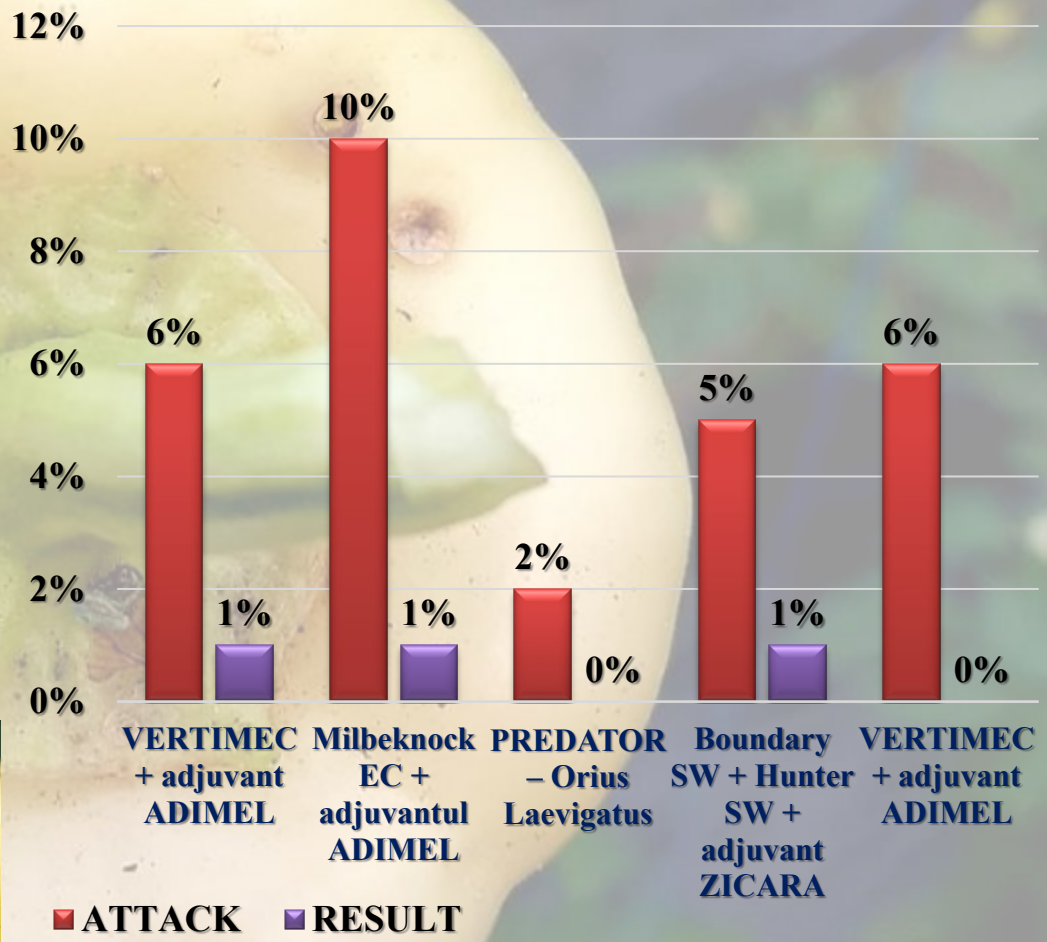
2.2. RESULTS ON THE EFFECTIVENESS OF THE TREATMENT PROGRAM IN THE MANAGEMENT OF PESTS ATTACKS

HELICOVERPA ARMIGERA





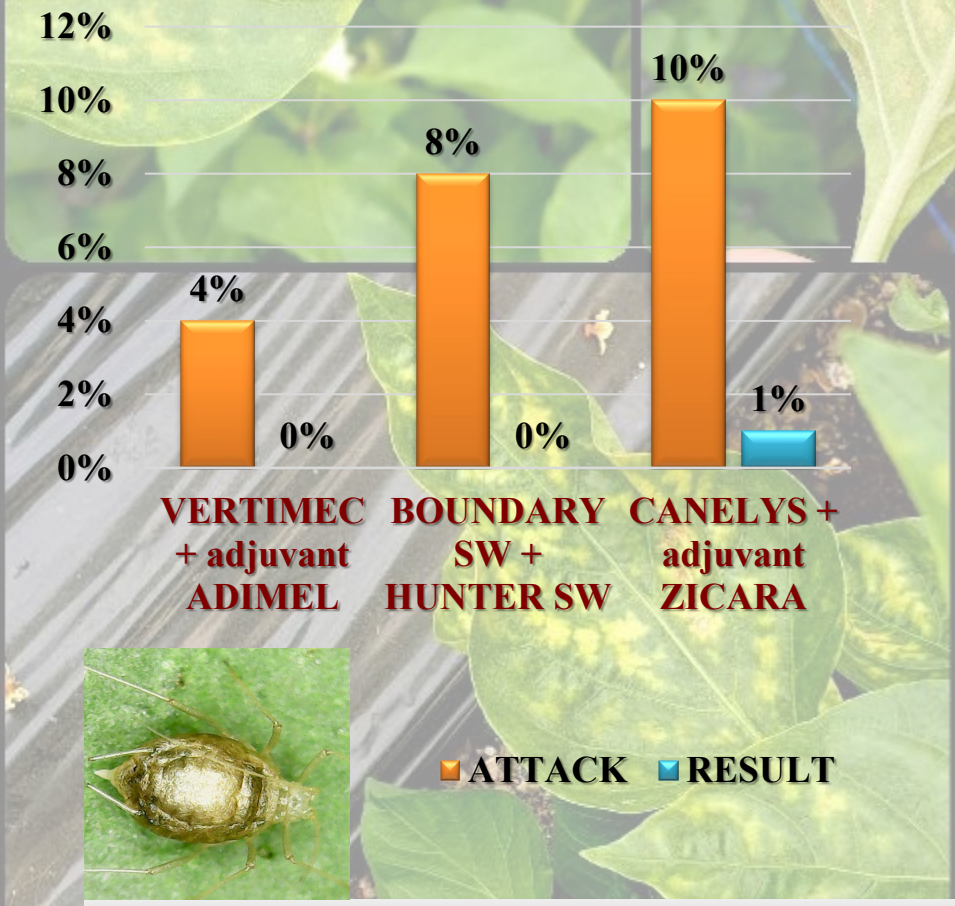
DEROCERAS AGRESTE



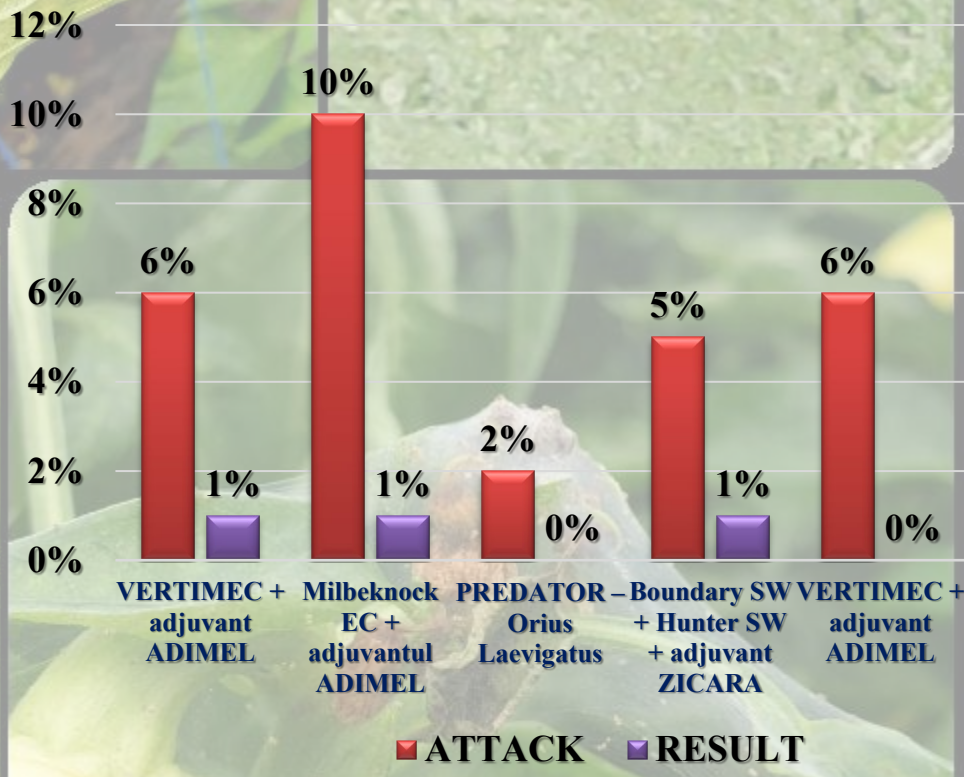
RESULTS AND DISCUSSIONS

2.2. RESULTS ON THE EFFECTIVENESS OF THE TREATMENT PROGRAM IN THE MANAGEMENT OF PESTS ATTACKS

POLYPHAGOTARSONEMUS LATUS



TETRANYCHUS URTICAE



CONCLUSIONS AND RECOMMENDATIONS

1. The presence of **viruses** was due to the existence of thrips in culture, as the main vector in transmission. This can be avoided in the future by using zoophages much earlier in the field and spraying with organic **Bio Shore** product.
2. The **treatments** were applied on time based on continuous **monitoring** and in optimal doses, increasing their **effectiveness**, with very good **results**.
3. **Predators** use have increased **production** and led to a smaller number of pest **treatments**.
4. The effect of the use of zoophages can be **observed** in the **following year** of cultivation since the seedling phase, thrips being almost non-existent in this phase **(2021).**
5. I also **recommend** the use of other **zoophages** for various pests, for a more biological control and with a **much better** quantitative and qualitative increase in **production**.

Exhibitline Sf - beneficial nematode and a biological control agent that helps control the larvae of ***Sciaridae*** and of ***The Californian Thrips*** .

Montyline is a biological control mechanism based on the predator ***Amblyseius montdorensis*** - feeds on multiple types of small arthropods and pollen: **thrips, mites, whitefly .**

THANK YOU FOR YOUR ATTENTION!